

CLAIMS

What is claimed is:

- 5 1. A wear resistant grinding machine component, comprising:
 a grinding machine component made of a solid ceramic material selected
 from the group consisting of carbides, nitrides, oxides, borides, cermets, carbonitrides, and
 combinations thereof.
- 10 2. An extremely high precision wear resistant grinding machine
 component for a high precision centerless grinding machine, comprising:
 a grinding machine component made of a solid piece of an extremely
 rigid and very hard, non-flexing material selected from the group consisting of ceramics,
 carbides, nitrides, borides, oxides, oxynitrides, carbonitrides, alumina, cermets, nitrides,
15 borides, oxides, and combinations thereof,
 wherein the grinding machine component may include the entire
 component being made of a ceramic material, a sleeve of solid ceramic material adhered over
 a metallic substrate base, and a grinding machine component made of a cermet material,
 formed into a grinding machine component.
- 20 3. The grinding machine component of claim 1, wherein the grinding
 machine component is selected from the group consisting of tension rods, transfer ways,
 spindles, spindle housings, pivot rods, threaded shaft rods, concentric shaft seals, lead screws,
 and combinations thereof.
- 25 4. The grinding machine component of claim 1, wherein the grinding
 machine component is non-flexing and maintains a very high tolerance of from about
 0.000005 inch to about 0.000030 inch.
- 30 5. The grinding machine component of claim 1, wherein the grinding
 machine component enables a repeatability factor of from about 0.000005 inch to about
 0.000030 inch.

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6. The grinding machine component of claim 1, wherein the grinding machine component is made of a metallically infiltrated cermet material made from a spongy ceramic and then infiltrated with a molten metal which is thereafter allowed to solidify within the matrix of the spongy ceramic.

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7. The grinding machine component of claim 1, wherein the grinding machine component further includes a metallic component incorporated into the ceramic material to increase the strength of the component.

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8. The grinding machine component of claim 7, wherein the grinding machine component further includes a metallic component in the ceramic material selected from the group consisting of cobalt, vanadium, chromium, manganese, nickel, copper, zinc, molybdenum, cadmium, indium, tin and combinations thereof.

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9. The grinding machine component of claim 7, wherein the grinding machine component further includes the metallic component in a concentration of from about 1 to about 50 percent by weight.

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10. The grinding machine component of claim 1, wherein the ceramic grinding machine component further includes a magnetic component including a component selected from the group consisting of powdered iron, niobium, yttrium and combinations thereof.

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11. The grinding machine component of claim 10, wherein the grinding machine component further includes the magnetic component in a concentration of from about 1 to about 25 percent by weight.

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12. The grinding machine component of claim 1, wherein the grinding machine component may be formed into a grinding machine component by forming a hard surface layer by a method selected from the group consisting of carburizing and carbonitriding.

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13. The grinding machine component of claim 12, wherein the grinding machine component formed into a grinding machine component by carburizing is accomplished by carburizing by a method selected from the group consisting of gas

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carburizing by placing in a carburizing gaseous atmosphere, pack carburizing by placing all the surfaces in contact with a solid compound, and combinations thereof.

14. The grinding machine component of claim 12, wherein the grinding
5 machine component is formed into a grinding machine component by carbonitriding by dissociating ammonia into hydrogen and nitrogen.

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